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(54) Transparent film complex

(57) A transparent film complex for packaging and protection is described. The complex comprises at least two layers of self-supporting flexible transparent film. The layers contain between them, or between two of them, at least one non-self-supporting layer of material having UV absorbing properties.

Preferably the layers of self-supporting flexible transparent film are of at least two different materials, to confer on the finished complex the advantageous properties of those materials.

The non-self-supporting layer preferably comprises 2-(2-hydroxy-3, 5-di-tertiary amyl phenyl)-2H-benzotriazole as a UV absorber, and an adhesive for binding together the layers of self-supporting film.

The film may be formed into

open dishes or trays, or sealed containers, and portions of the complex may be opaque.

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SPECIFICATION

Transparent flexible film complexes

- 5 This invention relates to flexible film complexes, such as laminates, which are useful, inter alia, for wrapping and packaging.

- 10 It is well known to provide flexible films which are both transparent to light in the visible spectrum and which also substantially absorb light in the ultraviolet range, this latter property being especially desirable where the films are used to protect or package goods, especially foods, which may deteriorate under exposure to UV light.

- 15 The UV-absorbing property has been conferred on such films by either compounding known UV-absorbers into the substance from which the flexible films are formed, or by coating such films after their formation with coatings containing UV-absorbers. However the former may inhibit the choice of absorber due to the exposure to temperature necessary in the film forming, while the latter course has the limitation that the exposed coating leaves the UV-protective layer vulnerable to damage by abrasion during normal handling, and further may be undesirable, where food is concerned, due to the possibility of migration of the coating constituents, including the UV absorber, into the food.

- 20 According to the present invention there is provided a transparent film complex for packaging and protection purposes, wherein the complex comprises at least two layers of self-supporting flexible transparent film, containing between them, or between two of them, at least one non-self-supporting layer of material having UV absorbing properties.

- 25 The layers of flexible transparent film may be of the same material (e.g. polypropylene) but will frequently be of at least two different materials which are chosen so that they have complementary properties of value for the end-use envisaged. For example, one layer may be of polyethylene terephthalate for toughness whilst another layer may be of polyvinylidene chloride for its barrier properties to certain gases and vapours.

- 30 It is convenient to compound the non-self-supporting layer containing the UV absorbing agent so that this layer also has adhesive properties suitable for maintaining the cohesion of the whole filmic structure. Such adhesives suitable for use with the known flexible transparent self-supporting films are well known in the art.

- 35 It has been found that the present transparent film complexes may be thermoformed into dishes or trays without diminution of the UV-absorbing properties of the complex, and that such containers, after filling with food, may be closed by sealing on to them (with or without prior evacuation of air or the introduction of gases alternative to air) lids or closures

made from similar complexes or from other suitable films. In the event that transparency is not desired in this closure material, the UV barrier properties desired in the closure may

- 70 in some cases be provided more cheaply by solid printing or perhaps by using a layer of opaque material such as aluminium foil. Such sealed packs comprising a transparent container and lid or closure which may be opaque are found to have the combined advantage that the goods are freely visible, whilst not suffering from deterioration by the levels of daylight or display lighting to which the packs are subjected when displayed for sale, this being particularly desirable when the sealed packs contain foods. The deterioration otherwise experienced may include rancidity and loss or change of colour and flavour for food, and undesirable change of colour and physical properties for, for example, textiles.

- 80 It will be appreciated that the present transparent film complex may be made up into packages or containers in conventional manner and may be printed either before or after such making up. Indeed, regions of the complex may be rendered opaque by such printing or by aluminium foil, both acting as UV-absorbers, but there must be some transparent regions so that goods can be inspected.

- 85 It has been found that a particularly useful absorber for use in UV-absorbing layer is 2-(2-hydroxy-3,5-di-tertiary amyl phenyl)-2H-benzotriazole, but other known UV-absorbers may be used.

- 90 The invention will now be illustrated by the following Examples.

EXAMPLE 1

- A film of polyamide 6,6', 38 micron thick, was coated with a 10 micron layer of polyvinylidene chloride and then this surface was coated with a solution comprising a solution of 2-(2-hydroxy-3,5-di-tertiary amyl phenyl)-2H-benzotriazole as a UV-absorber dissolved in ethyl acetate, and a one-pack polyurethane adhesive sold under the Trade Name "Holdens" 2300/2A. The solvent was evaporated using air at 80°C. to give a 2 micron thick layer, and this layer was applied to the corona treated surface of a web of low density polyethylene film 80 micron thick, in a nip heated to 70°C. The UV absorber comprised 5% by weight of the adhesive layer.

EXAMPLE 2

- A second film was prepared in which 12 micron thick polyethylene terephthalate film replaced the polyamide in the construction of Example 1. The two films were found suitable for the opposing layers of a composite pack, formed by heat-sealing together the edges of the respective low density polyethylene surfaces, either with or without evacuation of air, and either with or without prior thermoforming of the first-named structure into shallow dishes. Finished packs were tested with both smoked salmon and smoked sausage as food

content, and were found to give increased shelf-life and protection against deterioration, while allowing good visual inspection of the sealed-in contents.

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CLAIMS

1. A transparent film complex for packaging and protection purposes, wherein the complex comprises at least two layers of self-supporting flexible transparent film, containing between them, or between two of them, at least one non-self-supporting layer of material having UV absorbing properties.
2. A transparent film complex as claimed in Claim 1, wherein the layers of self-supporting flexible transparent film are of at least two different materials.
3. A transparent film complex as claimed in Claim 1 or 2, wherein the layers of self-supporting flexible transparent film comprise material selected from polypropylene, polyethylene terephthalate, polyvinylidene chloride, and polyamide.
4. A transparent film complex as claimed in any preceding claim, wherein the, or at least one of said non-self supporting layer(s) comprises also an adhesive for binding together the adjacent self-supporting layers.
5. A transparent film complex as claimed in any preceding claim, wherein the, or at least one of said non-self-supporting layer(s) comprises 2-(2-hydroxy-3, 5-di-tertiary amyl phenyl)-2H-benzotriazole as a UV absorber.
6. A transparent film complex as claimed in any preceding claim, wherein a part of said non-self-supporting layer comprises printing ink, or is replaced by aluminium foil, the complex being opaque in the regions of said ink or foil.
7. A transparent film complex substantially as hereindescribed with reference to Example 1 or Example 2.
8. A dish or tray made by thermoforming the transparent film complex of any one of Claims 1 to 7.
9. A sealed container made by sealing to the dish or tray of Claim 8 a lid.
10. A sealed container as claimed in Claim 9, wherein the lid is formed from the complex claimed in Claim 6.
11. A sealed container substantially as hereindescribed with reference to Example 2.

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